

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1-17. (Canceled)

18. (Currently Amended) A special effect device in which picture signals are read out from a frame buffer based on an address signal to impart a desired special effect to the picture signals read out from said frame buffer, said special effect device comprising:

address signal generating means for generating readout address signals of said picture signals stored in said frame buffer so that a special effect will be produced in which a picture corresponding to the picture signals stored in said frame buffer is fractionated into plural partial pictures, having a wavy boundary line, defined by a preset function F, at the time of display, said partial pictures being translated so as to disappear to outside the display area,

wherein said preset function F is defined as:

$$F(x) = F((y1 - \text{fixPhase}) \times \text{fixFrequency})$$

wherein said address signal generating means generates, for a case in which, with the amount of movement trans, said preset function F, the maximum amplitude of the waveform produced by said function F fixAmplitude, the frequency fixFrequency and with the phase fixPhase, the center of a picture corresponding to the picture signals stored in said frame buffer is at the point of origin of a rectangular coordinate system, the readout address signal (X1, Y1) of said picture signals, translating plural partial pictures as fractionated by said wavy boundary line

defined by said preset function F, so that the partial pictures are caused to disappear to outside the display area, by the equation (4-3):

$$\begin{aligned} X1 &= f_2(x1 - f_1(y1)) + f_1(y1) \\ Y1 &= y1 \end{aligned} \tag{4-3}$$

which satisfies the equations (4-4) and (4-5):

$$f_1(y1) = \text{fixAmplitude} \times F((y1 - \text{fixPhase}) \times \text{fixFrequency}) \tag{4-4}$$

$$f_2(t) = \begin{cases} t + \text{trans} & (t \leq -\text{trans}) \\ \text{Max} & (-\text{trans} < t \leq \text{trans}) \\ t - \text{trans} & (\text{trans} < t) \end{cases} \tag{4-5}$$

where

$$t = x1 - f_1(y1)$$

said address signal generating means further generating the readout address signal

(X0, Y0) on rotation of the rectangular coordinate axis by φ by the equation (4-6):

$$\begin{aligned} X0 &= X1 \cos \varphi - Y1 \sin \varphi \\ Y0 &= X1 \sin \varphi + Y1 \cos \varphi \end{aligned} \tag{4-6}$$

said address signal generating means further generating the readout address signal

(X, Y), for a case where the position of the point of origin in the rectangular coordinate system of a picture corresponding to picture signals stored in said frame buffer, by the equation (4-7):

$$\begin{aligned} X &= X0 + cx \\ Y &= Y0 + cy \end{aligned} \tag{4-7}$$

where, in the equation (4-5), Max denotes generation of a readout address signal for reading out a signal other than said picture signals stored in said frame buffer.

19. (Canceled)

20. (Currently Amended) An address signal generating device for generating an address signal for reading out picture signals from a frame buffer, said address signal generating device including:

address signal generating means for generating a readout address signal of said picture signals stored in said frame buffer so that a special effect will be produced in which a picture corresponding to the picture signals stored in said frame buffer is fractionated into plural partial pictures having a wavy boundary line as defined by a preset function F at the time of display and in which each partial picture is translated to disappear to outside the display area,

wherein said preset function F is defined as:

$$F(x) = F((y1 - \text{fixPhase}) \times \text{fixFrequency})$$

wherein said address signal generating means generates, for a case in which, with the amount of movement trans, said preset function F, the maximum amplitude of the waveform produced by said function F fixAmplitude, the frequency fixFrequency and with the phase fixPhase, the center of a picture corresponding to the picture signals stored in said frame buffer is at the point of origin of a rectangular coordinate system, the readout address signal (X1, Y1) of said picture signals, translating plural partial pictures as fractionated by said wavy boundary line defined by said preset function F, so that the partial pictures are caused to disappear to outside the display area, by the equation (4-3):

$$\begin{aligned} X1 &= f_2(x1 - f_1(y1)) + f_1(y1) \\ Y1 &= y1 \end{aligned} \tag{4-3}$$

which satisfies the equations (4-4) and (4-5):

$$f_1(y1) = \text{fixAmplitude} \times F((y1 - \text{fixPhase}) \times \text{fixFrequency}) \tag{4-4}$$

$$f_2(t) = \begin{cases} t + \text{trans} & (t \leq -\text{trans}) \\ \text{Max} & (-\text{trans} < t \leq \text{trans}) \\ t - \text{trans} & (\text{trans} < t) \end{cases} \tag{4-5}$$

where

$$t = x1 - f_1(y1)$$

said address signal generating means further generating the readout address signal

(X0, Y0) on rotation of the rectangular coordinate axis by ϕ by the equation (4-6):

$$\begin{aligned} X0 &= X1 \cos \phi - Y1 \sin \phi \\ Y0 &= X1 \sin \phi + Y1 \cos \phi \end{aligned} \tag{4-6}$$

said address signal generating means further generating the readout address signal

(X, Y), for a case where the position of the point of origin in the rectangular coordinate system of

a picture corresponding to picture signals stored in said frame buffer, by the equation (4-7):

$$\begin{aligned} X &= X0 + cx \\ Y &= Y0 + cy \end{aligned} \tag{4-7}$$

where, in the equation (4-5), Max denotes generation of a readout address signal

for reading out a signal other than said picture signals stored in said frame buffer.

21. (Currently Amended) An address signal generating method for generating an address signal for reading out picture signals from a frame buffer, said address signal generating method including:

an address signal generating step of generating a readout address signal of said picture signals stored in said frame buffer so that a special effect will be produced in which a picture corresponding to the picture signals stored in said frame buffer is fractionated into plural partial pictures having a wavy boundary line as defined by a preset function F at the time of display and in which each partial picture is translated to disappear to outside the display area,

wherein said preset function F is defined as:

$$F(x) = F((y1 - \text{fixPhase}) \times \text{fixFrequency})$$

wherein said address signal generating step generates, for a case in which, with the amount of movement trans, said preset function F, the maximum amplitude of the waveform produced by said function F fixAmplitude, the frequency fixFrequency and with the phase fixPhase, the center of a picture corresponding to the picture signals stored in said frame buffer is at the point of origin of a rectangular coordinate system, the readout address signal (X1, Y1) of said picture signals, translating plural partial pictures as fractionated by said wavy boundary line defined by said preset function F, so that the partial pictures are caused to disappear to outside the display area, by the equation (4-3):

$$\begin{aligned} X1 &= f_2(x1 - f_1(y1)) + f_1(y1) \\ Y1 &= y1 \end{aligned} \tag{4-3}$$

which satisfies the equations (4-4) and (4-5):

$$f_1(y1) = \text{fixAmplitude} \times F((y1 - \text{fixPhase}) \times \text{fixFrequency}) \tag{4-4}$$

$$f_2(t) = \begin{cases} t + \text{trans} & (t \leq -\text{trans}) \\ \text{Max} & (-\text{trans} < t \leq \text{trans}) \\ t - \text{trans} & (\text{trans} < t) \end{cases} \quad (4-5)$$

where

$$t = x_1 - f_1(y_1)$$

said address signal generating means further generating the readout address signal

(X0, Y0) on rotation of the rectangular coordinate axis by ϕ by the equation (4-6):

$$\begin{aligned} X0 &= X1 \cos \phi - Y1 \sin \phi \\ Y0 &= X1 \sin \phi + Y1 \cos \phi \end{aligned} \quad (4-6)$$

said address signal generating means further generating the readout address signal

(X, Y), for a case where the position of the point of origin in the rectangular coordinate system of a picture corresponding to picture signals stored in said frame buffer, by the equation (4-7):

$$\begin{aligned} X &= X0 + cx \\ Y &= Y0 + cy \end{aligned} \quad (4-7)$$

where, in the equation (4-5), Max denotes generation of a readout address signal for reading out a signal other than said picture signals stored in said frame buffer.

22. (Currently Amended) An address signal generating program stored on a computer readable medium for having a computer execute a process of generating an address signal for reading out picture signals from a frame buffer, said address signal generating program allowing a computer to execute:

an address signal generating step of generating a readout address signal of said picture signals stored in said frame buffer so that a special effect will be produced in which a

picture corresponding to the picture signals stored in said frame buffer is fractionated into plural partial pictures having a wavy boundary line as defined by a preset function F at the time of display and in which each partial picture is translated to disappear to outside the display area,

wherein said preset function F is defined as:

$$F(x) = F((y1 - \text{fixPhase}) \times \text{fixFrequency})$$

wherein said address signal generating step generates, for a case in which, with the amount of movement trans, said preset function F, the maximum amplitude of the waveform produced by said function F fixAmplitude, the frequency fixFrequency and with the phase fixPhase, the center of a picture corresponding to the picture signals stored in said frame buffer is at the point of origin of a rectangular coordinate system, the readout address signal (X1, Y1) of said picture signals, translating plural partial pictures as fractionated by said wavy boundary line defined by said preset function F, so that the partial pictures are caused to disappear to outside the display area, by the equation (4-3):

$$\begin{aligned} X1 &= f_2(x1 - f_1(y1)) + f_1(y1) \\ Y1 &= y1 \end{aligned} \tag{4-3}$$

which satisfies the equations (4-4) and (4-5):

$$f_1(y1) = \text{fixAmplitude} \times F((y1 - \text{fixPhase}) \times \text{fixFrequency}) \tag{4-4}$$

$$f_2(t) = \begin{cases} t + \text{trans} & (t \leq -\text{trans}) \\ \text{Max} & (-\text{trans} < t \leq \text{trans}) \\ t - \text{trans} & (\text{trans} < t) \end{cases} \tag{4-5}$$

where

$$t = x1 - f_1(y1)$$

said address signal generating means further generating the readout address signal

(X0, Y0) on rotation of the rectangular coordinate axis by ϕ by the equation (4-6):

$$\begin{aligned} X0 &= X1 \cos \phi - Y1 \sin \phi \\ Y0 &= X1 \sin \phi + Y1 \cos \phi \end{aligned} \quad (4-6)$$

said address signal generating means further generating the readout address signal

(X, Y), for a case where the position of the point of origin in the rectangular coordinate system of a picture corresponding to picture signals stored in said frame buffer, by the equation (4-7):

$$\begin{aligned} X &= X0 + cx \\ Y &= Y0 + cy \end{aligned} \quad (4-7)$$

where, in the equation (4-5), Max denotes generation of a readout address signal for reading out a signal other than said picture signals stored in said frame buffer.

23-27. (Canceled)